**TAD05 – A1-A6 IB Practice MS**

**1.** (a) measure low concentration of metals; 1

(b) absorbance reading of 0.80 = 170 mg $cm^{-3}$;
(sample diluted by 10, therefore concentration of iron =
10×170 mg $cm^{-3}$ = 1700 mg $cm^{-3}$ =) 1.7 mg $cm^{-3}$; 2

(c) *Atomizer*
ions are converted/dissociated into atoms;
*Monochromatic light source*
Hollow cathode lamp specific to the element to be analyzed; 2

**[5]**

**2.** (bond) stretching/change in bond length;
bending/change in bond angle;
non-polar/no (change in) dipole moment;

**[3]**

**3.** (a) I corresponds to A;
II corresponds to C;
III corresponds to B; 2

*Award **[1]** for identifying each of two matches (the third one is automatically determined).*

I = O-H;
II = C=O;
III = C=C; 3

(b) A;
higher wavenumbers imply higher energies; 2

**[7]**

**4.**

| Information | Analytical technique |
|---|---|
| Isotopic composition of an element | Mass spectrometry;<br>*Accept Mass spectroscopy.* |
| Functional groups present in an organic compound | Infrared spectroscopy; |
| Concentration of $Fe^{3+}$ ions in industrial waste waters | Visible spectroscopy/flame spectroscopy/ colorimetry;<br>*Accept UV/visible but not UV on its own.* |

**[3]**

**5.**

| Information | Analytical technique |
|---|---|
| Number of different hydrogen environments | ($^1$H) NMR; |
| Types of functional groups | IR; |
| Molecular mass | Mass spectrometry; |

*Award **[2]** for three correct, **[1]** for two correct.*

**[2]**